



# CIDB

## The PSI Controls Inventory DataBase

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(for the CIDB Team)

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# Introduction

- The Controls Hardware group at PSI is responsible of
  - Specifying (when we are lucky to be early enough...)
  - Purchasing and delivering to the users
  - Maintaining (repairs, upgrades)
  - Developing when needed

the control system hardware for three accelerators  
and the respective beamlines

more than 300 VME 64x crates, 150 CAMAC  
crates (to be gradually replaced as budget and  
manpower allows), more than 120 types of  
hardware (part types)

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# Introduction

- There is a lot of routine logistics involved
    - Maintain the stock level, order new parts
    - Send parts to repair (or repair in-house)
    - Deliver parts to the users, or install them
    - Keep track of the costs
  - Expectations on quality
    - Hardware should be tested and tracked
    - Data on calibrations, firmware upgrades, faults and repairs should be available
    - Replacements (spares) have to always be available
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# CIDB is...

- A database-based application that
    - Enables us to track the control system hardware (stock, installations)
    - Embeds the working practices related to controls hardware distribution and maintenance (transparency)
    - Tries to make our (controls group HW&SW, system developers, other related groups) life easier
    - It is limited to the hardware handling, but is able to provide configuration information (installation hierarchy)
  - Note: I am not a database expert; I will not show any table diagrams or other details in this talk. However, details can be obtained from the developers if wanted.
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# Goals

- To know what hardware is installed where
    - Versions, (fault) history, firmware, pricing,...
  - To know the stock status
    - To keep enough cards in stock, order early enough
  - To improve quality
    - Introduce systematic tests, record results
  - To ease the work
    - Our (hardware group) and the software developer's (requesting new hardware)
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# Goals

- Improve the way of working
    - Better defined work procedures
      - Define the ‘business rules’
    - Better tracking of what happened
      - All hardware moves are recorded (history), etc.
    - Easier requesting of hardware
      - Emails can only be seen by recipients, no overview of what has been requested and issued
    - Introduce user ‘roles’
      - Stock manager, system responsible
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# Some concepts

- Part
    - Component of the control system: VME crate, IOC, carrier board, ADC, DAC,...
  - Connector
    - Defines how parts fit together (VME bus, IP bus, etc.)
  - Health
    - Is the part known to be OK (tested), broken or unknown?
  - System
    - A collection of parts to perform a control system task (typically, but not necessarily a VME crate with one IOC.)
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# The application

- Oracle database
  - Web-based GUI (PHP)
  - Developed in collaboration with the Northwest Switzerland Univ. of Applied Sciences (FHNW)
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# Workflow

- The control system hardware consists of **parts** of several types
  - The parts are purchased and go to (one of a few) stock.
    - Before that, the parts undergo a functionality test (not fully implemented yet.)
  - Users request (internal ‘order’) for hardware parts:
    - ‘I need a CPU card by next Monday’. Hopefully needs are known well in advance
  - Parts are delivered from stock and installed in systems
  - Faulty hardware comes back to the stock manager and is sent to repair. Replacement is requested
  - Stock manager(s) are aware of what is in stock, what is requested, what is in repair, etc.
  - History of each module (‘life history’) is recorded
  - History of each system is recorded
  - History of each request and delivery is recorded
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# Installations

- A system is a collection of parts
    - Parts (usually) are hierarchically connected together (parent-child relationship)
    - Has a system responsible (and possible delegates)
  - Each part is of a known part type
    - Part type defines the general properties (connectivity, type-specific information)
  - Part connectivity is defined by a ‘connector compatibility matrix’
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# User roles

- Two user roles: Stock Manager, system user
  - Stock manager can
    - Assign parts to users
    - Define new part types and their connectivity
    - Has full access to all information
  - System user
    - Manages parts assigned to him/her
    - Requests new parts from the stock when needed
    - Has access to information of his/her systems
    - Read access for other systems
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# System view

PSI Controls Inventory Database

Home | Inventory | Systems | Administration | Help | Logout

My systems  
System search  
Create a new system  
System report

System details

System information

System name: ARIMA-VME-BC  
Responsible: MIGRATION USER  
Facility Group: Migration Facility/Migration Group  
Description:  
History: ✓

Crate CR156 located at WSLA.38.0.3

Additional hardware  
PSU 16878

Front

01	IOC179	empty
02	TMR039	empty
03	ISC428	empty
04	IPQ002	IPQ012 IPQ334 IPQ335
05	empty	
06	empty	
07	empty	
08	empty	
09	empty	
10	empty	
11	empty	
12	empty	
13	empty	
14	empty	

Back

01	empty
02	TMR042
03	TPS117
04	empty
05	empty
06	empty
07	empty
08	empty
09	empty
10	empty
11	empty
12	empty
13	empty
14	empty
15	empty
16	empty
17	empty
18	empty
19	empty
20	empty
21	empty

System contents (VME crate)  
-nonhierarchical installations  
are also supported

Controls Inventory Database

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System information

System name: ARIMA-VME-BC  
Responsible: MIGRATION USER  
Facility Group: Migration Facility/Migration Group  
Description:  
History: ✓

Crate CR156 located at WSLA.38.0.3

Additional hardware  
PSU 16878

Request part:

Part type: Analog I/O  
Date needed (MM/DD/YYYY): 03/31/2006  
Amount: 1  
Comment:

Request

Front

01	IOC179	empty
02	TMR039	empty
03	ISC428	empty
04	IPQ002	IPQ012 IPQ334 IPQ335
05	empty	
06	empty	
07	empty	
08	empty	
09	empty	
10	empty	
11	empty	
12	empty	
13	empty	
14	empty	
15	empty	
16	empty	
17	empty	
18	empty	
19	empty	
20	empty	
21	empty	

Back

01	empty
02	TMR042
03	TPS117
04	empty
05	empty
06	empty
07	empty
08	empty
09	empty
10	empty
11	empty
12	empty
13	empty
14	empty
15	empty
16	empty
17	empty
18	empty
19	empty
20	empty
21	empty

Request part:  
-select part type from a list  
-add count & date needed



# Stock manager's view

The screenshot shows a web browser window displaying the 'Controls Inventory Database' application. The page title is 'Pending requests'. On the left, there is a navigation menu with links: 'Part Administration', 'Connectors', 'Part types', 'Pending requests', and 'Reports'. The main content area shows a table of 'Last assigned parts' with columns: Label, Parttype, Date assigned, System, and Stockmanager. Below this, it says 'Sort by: System | Parttype' and '16 requests found.' There are two tables for requested parts, one for 'System: X03MA-VME-FE' and one for 'System: X03MA-VME-OP2'. Each table has columns: Parttype, Amount, Date needed, Comment, and Process.

Label	Parttype	Date assigned	System	Stockmanager
CR114	Trennew 16878	2006-03-24 12:25	XTEST-VME-MOT2	Martin Heinger
CR268	Trennew 16878	2006-03-24 12:23	XTEST-VME-MOT2	Martin Heinger
CR114	Trennew 16878	2006-03-24 12:15	XTEST-VME-MOT2	Martin Heinger
PC330	VICB 8002	2006-03-23 14:08	XTEST-VME-OL1	Martin Heinger
ECM010	ECM 504	2006-03-23 13:58	X03MA-VME-OP2	Martin Heinger

Parttype	Amount	Date needed	Comment	Process
VTB 8305	1	2006-03-29		
VICB 8002	1	2006-03-29		
OMS VME 58 8	1	2006-03-29		
VICB 8001	1	2006-03-29		
VTB 8201	1	2006-03-29		

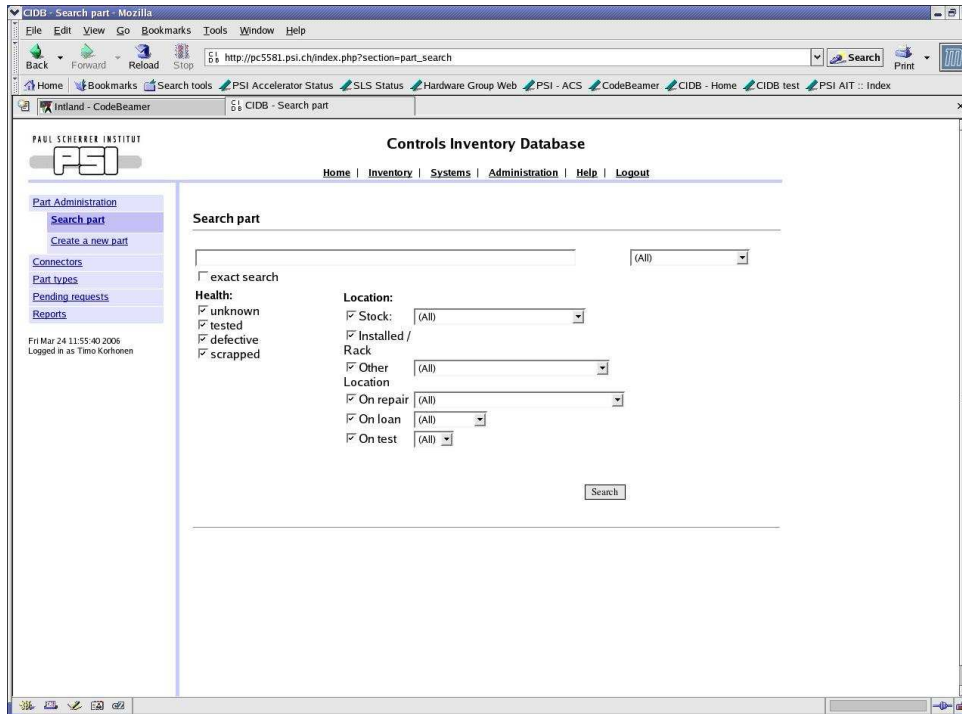
  

Parttype	Amount	Date needed	Comment	Process
MVMES100	1	2006-03-29	slot 1	

Requested parts view:

- all hardware requests are listed (by system/parttype/date needed)
- stock manager selects the part from stock and puts it in

# Part search



Each part (hardware card) has a unique ID

-can be searched by its ID, location, health (tested, defect, unknown,...)

-the part's full history is available (when purchased, installed, tested, moved, broken, repaired,...)

Available to any user.



# Reports

Stock report

Parttype Report (PDDXLS)

Parttype	C	Total	Installed	In Other location	Loan	On Repair	On Test	On Stock	Requested
ADC 8401	+	389	217	45	1	35		91	
ADC 8403	+	33	7			2		24	
CAL100	+	138	103	4		21		10	
CPA250-4530	+	3	3						
DAC 8402	+	101	33	18	2	24		24	
DIO 8505	+	20		20					
Delta Tau VME VME	+	1		1					
ECM 504	+	53	41	12					2
ECM 505/06	+	6	5					1	
ELMA BV3520 Type 11	R	10	5	4		1			
ELMA BV6733-100	+	2	2						
ELMA BV6733-200	+	3		3					
ERN-100	+	50	22	21	1			6	
ERO-100	+	60	41	8	1			10	
EVG-100	+	3	3						
EVG-100	+	9	5	1	1	4		2	
EVR-100	+	141	121	4	1	4		11	
FAN-100	+	21	13					8	
Hytec 3 Slot	R	1		1					
Hytec 4 Slot	-	1		1					
IK 342	+	4	4						
IP-RTD	-	1						1	
IP-THERMISTOR	-	1						1	
IP-THERMOCOUPLE	+	42	21		3			18	
IP-WatchDog	+	1						1	
IPS-TBA4	+	0							

## Stock report

-what is available, installed, requested, etc.

More: system report (configuration, pricing, etc.)

-system history (who has changed what parts and when)

And many more...

Location report

Location: UNKNOWN

Parttype	Amount	Parts
ADC 8401	1	IPAL21
CAL100	1	IC5025
DAC 8402	2	IP0052 IP0064
ECM 504	1	ECM031
ERN-100	1	TRN050
ERO-100	1	TRC040
EVG-100	1	TMC004
EVR-100	1	TMB102
MVME2304-0123	2	IOC184 IOC272
MVME2306	3	IOC023 IOC024 IOC182
MVME5100	2	IOC133 IOC334
OMS VME 58 8	2	STM016 STM105
PSC-IP2	1	IPQ143
PSC-TM 8 Link	1	JDS158
SC 8512	1	ISC001
TD4V17K44B	1	TMD006
Trennew 16878	2	CR286 CR302
UKTYPE	1	CR023
VTB 8201	1	TALL13
WES Crate	3	CR026 CR029 CR030
XM 664-80	1	TST005

## Location report

-what is at a specific location (stock, rack,..)

# Status & future

- Core functions
    - In use since February
    - CIDB has already much improved our view of the status, and enabled to share and distribute the work better
  - Integrate hardware testing
    - Work in progress
  - Include purchasing information
    - Important for ordering, repairs, budgeting, etc.
    - In progress, planned by end of June
  - New applications/modules
    - (diagnostics) component calibration management
  - Connection to / integration with IRMIS?
    - The functionality is largely complementary
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# What would be the gain?

- Integrate (routine) logistics to the control system lifecycle
- Configuration information would be automatically provided
- Possibility to improve quality management (systematic faults in some components, tracking of firmware/driver compatibility,...)
- follow the whole chain of signals from the source to the PV
- no need to record the same information twice

What is not clear to me:

- how much of this is already in IRMIS
  - how much effort it would be to integrate?
  - is it interesting for others than us?
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